

## TREATMENT OF FRACTURES OF THE FEMUR.\*

EXTENSION MADE FROM TRACTION BELOW THE KNEE OF THE INJURED, AND  
COUNTER-EXTENSION THROUGH A SIMILAR POSITION FROM THE  
IMMOBILIZED UNINJURED LIMB.

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FRACTURES were probably among the first accidents to demand sympathy and skill in the human race, and with this sympathy and skill constantly and universally in demand through all the centuries that have passed, it is hardly to be supposed that any new principle will ever be evolved. The most brilliant and modern of all, the open method, while it possesses all the advantages of exactitude and precision, is hardly likely, even with the assurance of absolute safety, ever to become the accepted method even in hospitals where its advantages can be most readily attained.

One of the first and most obvious demands in fracture of the thigh-bone is a provision for continuous and prolonged recumbency, and for this purpose fracture-beds have been contrived. These beds have engrossed the attention and elicited the combined inventive genius of lay and professional minds until they supply almost every conceivable want and add greatly to the ease of nursing and comfort of the patient, and yet, strange as it may seem, there is scarcely a hospital in Christendom that has a fracture-bed. There are many good reasons for the surgeon's aversion to fracture-beds, but there are equally cogent reasons why they should be used and it would not surprise the writer to see them resume their place as a necessary adjunct to the surgeon's requirements.

In fractures of the femur attention must always be directed to three untoward tendencies, viz., to rotation, angula-

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tion, and shortening,—three serious defects, any one of which if pronounced is attended with crippling results, and for whose correction scores of ingenious apparatuses have been devised, but each in turn to be found untrustworthy and disappointing.

Of the three tendencies to deformity, that of shortening has given the most trouble and has elicited the greatest skill. While the various appliances are legion, all the methods of extension can be arranged under two heads; in the first the two fragments are treated by different parts of the same apparatus, in the other an element is introduced wholly independent of the apparatus.

Under the first head I may mention the long splint, the upper end of which was attached to the trunk by means of straps, bandages and perineal bands to provide for counterextension, while extension was obtained by drawing down the parts connected with the lower fragments and securing them to the lower end of the splint. This simple device was elaborated by the attachments to the upper part—a bent iron shoulder-piece (Hodge) and a foot-piece with adjustable slot and graduating screws, but the fact that the lower end of the apparatus must extend several inches beyond the ends of the patient's feet, made the apparatus impracticable under ordinary circumstances and has driven a most admirable contrivance entirely out of existence.

The principle aimed at in the use of the long splint was afterwards attained by the employment of plaster of Paris. This was applied to the trunk and pelvis with a view to provide for counterextension, and then during extension was continued down the thigh covering in the entire extremity. This had the advantage of compactness and simplicity, but experience soon developed the fact that the counterextension was irksome and called for so many points of relief that the final results revealed a degree of disappointment that dampened the ardor of its early advocates and has left this as a mode of treatment to only a few who still feel that it offers the best means at our disposal for dealing with this formidable accident.

To overcome the tendency to angular deformity the

double inclined plane was devised. Upon this instrument was lavished all the skill of the mechanician—carved splints, extension pieces, adjustable joints with ratchets to establish fixation at any point, foot-pieces with extension plates and screws. But the final verdict was that no better results were attained than by simpler devices, and this theoretically perfect instrument sank slowly but surely to unmerited obscurity. It is still described in text-books, and very properly so, not with a view to recommending its use but rather to show what has been attempted in that line and why it has failed.

Of the second variety is the method of Buck in which gravity is used as the extending agent through pulley and weight attached by means of adhesive plaster to the parts below the seat of fracture. It is the simplest method, has enjoyed the greatest popularity and is still employed in many of our largest hospitals. So far as results are concerned there is really but little choice between methods. Within a couple of weeks from the reception of the accident the pain at the seat of the injury measurably abates and from this time on the restlessness of the patient may defeat the efforts of the most skilful surgeon with the most perfectly devised apparatus. One of the most common and glaring abuses of Buck's extension is the sliding down in the bed until the patient's foot rests against the foot-board of the bed. To prevent this the foot of the bed is raised, but rarely with any good result and the final result, with the best apparatus and the most skilful surgeon, shows that the best directed efforts may be thwarted by unruly and ungovernable patients.

In my treatment of fractures of the thigh-bone I have for many years been in the habit in selected cases of making the sound limb act as a splint and a means of counterextension to the injured one. I first began the practice in young children. Having first carefully enveloped the entire sound limb in protection it was enveloped in plaster of Paris. A similar course was pursued with the injured limb except that the plaster of Paris did not extend above the knee. The plaster was now permitted to set and get perfectly hard, after which

extension was made and when the two limbs were in symmetrical position a plaster bandage was made to bind both feet and legs together. With such a simple dressing I have had no further trouble throughout the entire treatment and in some instances have attained results with no ascertainable defect.

FIG. 1.

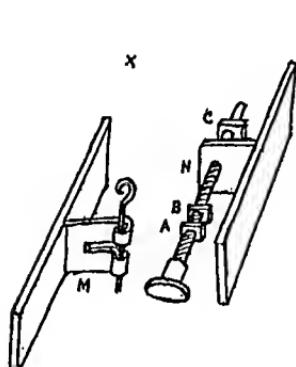


FIG. 2.

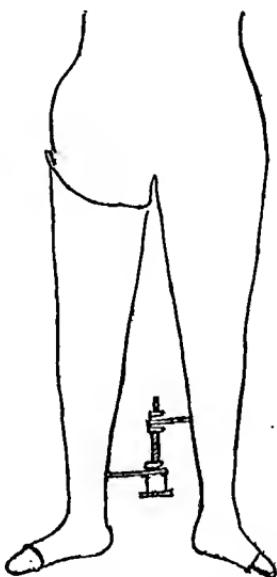


Fig. 1.—The parallel plates X Y made of iron  $\frac{1}{8}$  in. thick, 3 in. wide, 6 in. long. The attached pieces M N are about 3 inches long; M has a slot in it; N has a thread for the bolt. The nuts A B C are for fixation after the requisite amount of extension and rotation has been made.

Fig. 2.—The apparatus has been incorporated by means of a plaster bandage with the cast. The inequalities of the limbs have been overcome and the nuts tightened.

The reason for putting each limb in plaster separately and letting the plaster harden before binding them together is that after the first has fully hardened there is no danger of applying the final bandage so tightly as to make pressure sores possible.

In applying such a dressing to an adult I have found the resistance to extension even under ether, quite as much

as a strong man could overcome and in one instance the plaster cast shifted its position and produced a pressure sore.

To obviate the necessity of administering an anæsthetic, or depending upon an assistant to make traction, I have employed an apparatus illustrated in Figs. 1 and 2. The traction is so gradual, so firm and irresistible, that the patient hardly experiences any pain; while the satisfaction of comparison as the extension is being made is very great. Should there be any change in the relation of the casts and a slight shortening take place, a few turns of the connecting bolt will at any time rectify it. This apparatus is not confining; it will not prevent the patient from working down in bed until his feet rest against the foot-board, but both feet and both extremities must move in parallel lines and this change of posture will not affect the symmetry of the limbs. With this apparatus I have obtained union without appreciable shortening in a fracture of the neck of the femur partly within and partly without the capsule that immediately after the accident presented a shortening of an inch and a half. As a simple inexpensive and effective appliance for treating fractures of the femur I cannot too strongly urge it upon those whose patients are at a distance and cannot be seen daily.

One point in the dressing that I have regarded with special favor, is that while extension and rotation are provided for in the bolt and nuts, the apparatus does not conceal the injured limb. Hence any angulation laterally or any tendency to forward projection of the upper fragment can be readily detected as the swelling subsides, and minimized if not entirely corrected by appropriate measures.

This means of traction and fixation will be found most advantageous as a preliminary step to nailing or screwing the fragments together in delayed and imperfect union in intracapsular fracture of the neck of the femur.